Chapter 2
Socioeconomic Framework

Hilda R. Dávila-Ibáñez, Rosario H. Pérez-Espejo and Thalia Hernández-Amezcua

Abstract The use of the water resource is closely related to the geographical situation of the territory, but above all to the type and degree of socioeconomic development of countries, which is why in order to analyze water footprint in Mexico it is necessary to put the country's characteristics into context. This chapter presents a general view of the country and puts it into the World and Latin-American contexts based on the main socioeconomic indicators, highlighting the unequal income distribution, the rural bias of poverty and the particular importance of the agricultural sector. This sector's heterogeneity, as well as its relevance as a water user and an important cause of its deterioration are mentioned. We also mention that notwithstanding the importance of irrigation, to a good extent with underground water, the most important crops in Mexican people's diet is produced in rain-fed lands, and a high percentage of both irrigated and rain-fed fields are devoted to livestock raising. Mexico's growing dependence on food imports and the paradox that this brings environmental benefits is also commented upon.

Keywords Socioeconomic indicators · Water · Agriculture

2.1 Geographic and Demographic Characteristics

Mexico is country of contrasts and inequalities, both geographic and socioeconomic. In its territory spanning 1,964,375 km^2, located between meridians 118° 22′ and 86° 42′ east and latitudes 14° 32′ and 32° 43′ north, there is a great variety of climates. Two thirds can be considered arid or semiarid with precipitations below 500 mm annually and a third part located in the southeast with precipitations over 200 mn a year. Additionally, according the the National Water Commission (Spanish acronym: Conagua), 53 % of the population live in levels of over 1500 m of altitude (Conagua 2012). The 2010 Population and Housing Census (INEGI 2010) records 112,336,538 inhabitants. The National Population Council (Spanish acronym: Conapo) estimates this figure will reach 118,395,054 inhabitants by mid 2013.

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Since 1950 the country has undergone an accelerated urbanization process. It has gone from a rural majority (57.3 %) to become an urban country (76.8 %) this urban population is concentrated (29 %) in five great metropolitan areas: the Federal District, Mexico State and Hidalgo; Guadalajara; Monterrey, Puebla, Tlaxcala and Toluca. According to Conapo estimations this concentration will continue over the following years, which will increase the demand for public services in these regions.

Geographic and demographic contrasts are also reflected in the socioeconomic characteristics of the population. According to the marginalization study conducted by Conapo with census information,[1] in spite of the advances mad in marginalization indicators from different places the situation is still worrying as it can be seen in Fig. 2.1 There are 441 localities with a very high degree of marginalization, most of which are located in Guerrero, Chiapas, Oaxaca, Veracruz and Puebla.

Looking at the population welfare levels through the indicators of the United Nations on Human Development,[2] elaborated by the United Nations Development Program (UNDP) in Mexico, we see a similar situation. The development index for 2011 places Mexico in place 57 in the international list with a value of 0.770, that is, within the 25 % with high development. However, inequality among the different entities is acute. The highest welfare indexes are found in the Federal District, Nuevo Leon and Baja California, and they can compare to those in the Czech Republic or Poland. In contrast, Chiapas, Oaxaca and Guerrero have the lowest welfare indexes for the country (UNDP 2012b) (Fig. 2.2).

The other side of the coin is poverty among great sectors of the national population. Based on information from 2012, 45.5 % of the population was in poverty, which represents 53.3 million people, out of whom 11.5 million are in extreme poverty, equivalent to 9.8 % of the national population. Most of this population is found in Chiapas (1,629,200), Veracruz (1,122,000), Guerrero (1,111,500), Puebla (1,059,000), Mexico State (945,000) and Oaxaca (916,000).

[1]For the confection of its marginalization index for localities, Conapo considers the following variables: percentage of illiterate population 15 years old or more, percentage of the population without elementary school studies 15 years old or more, percentage of population living in housing no sanitary services and drainage, percentage of people living in housing without electric power, percentage of people living in housing without water piping, percentage of housing with overcrowding, percentage of people living in housing with dirt floor, percentage of population in localities with less than 5,000 inhabitants, percentage of people with income below two minimum wages.

[2]"The Human Development Index synthetizes the average progress on three basic aspects of human development, measured in a zero to one range, in which values closer to one represent higher human development. In reports previous to the twentieth edition of the HDI, the long and healthy life used to be measured by the life expectancy at birth index; the access to knowledge index was obtained by using the literacy rate and the combined enrollment rate together; while the decent standard of living was calculated through the gross domestic product per capita in Purchasing Power Parity (PPP) stated in US dollars. Thus, the HDI was obtained as the simple average, or arithmetic mean, of those three indicators".

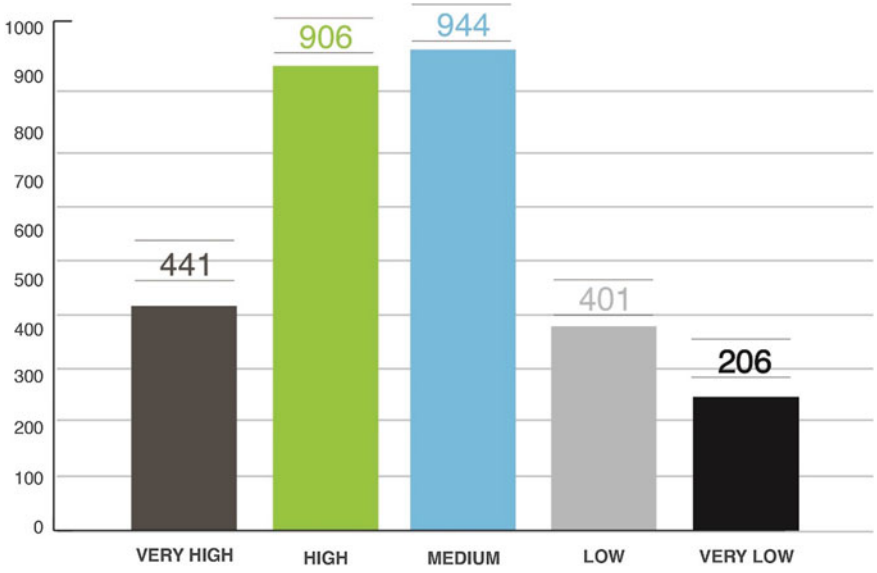

Fig. 2.1 Municipalities by degree of marginalization. *Source* Own elaboration with data from INEGI (2010)

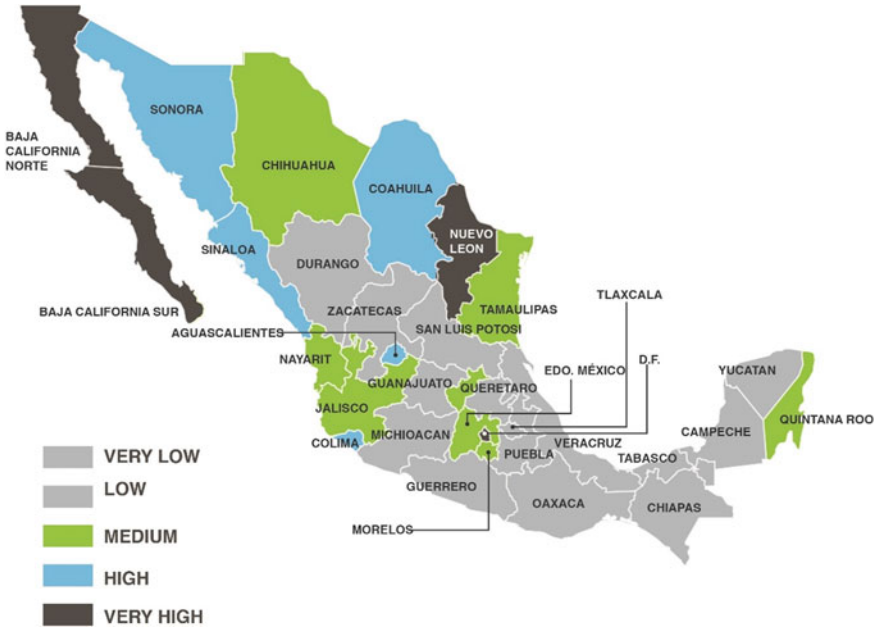

Fig. 2.2 Human Development Index in Mexico (2011). *Source* cartographic elaboration with the support of the University program for Metropolitan Studies, UAM, with data from UNDP (2011)

The 2008–2009 crisis was reflected in an acute increase of all type of poverty levels for 2010, which has not been able to be reverted in reverted in recent years. According to the new multidimensional methodology for the measure of poverty in Mexico, elaborated by the National Council for the Evaluation of Social Development Policy (Spanish acronym: Coneval), a concept that includes the variables income and social deprivations and an income below the welfare line. The population in poverty went down from 46.1 to 45.5 %, although it actually increased in number of people from 52.8 to 53.3 million; the population in extreme poverty—with an income less than the minimum welfare line and 3.7 in social deprivations—was decreased from 13 to 11.5 million people between 2010 and 2012. Although on the other hand there was a decrease in the real income of households, especially in urban areas, which resulted in an increase in the population with an income below the minimum welfare. The alarming thing is that only 19.8 % of the total population may be considered as not poor and not vulnerable (Fig. 2.3).

Poverty has a rural bias. In zones with a population of less than 2,500 inhabitants, the poverty rate is much higher than in urban zones, although it must be noted that there is a tendency in the opposite direction, the transfer programs such as *Oportunidades* (opportunities), which benefit rural areas as a priority, and the economic crisis of 2008–2009 that affected urban zones in a greater way, have increased poverty among cities' population (Fig. 2.4).

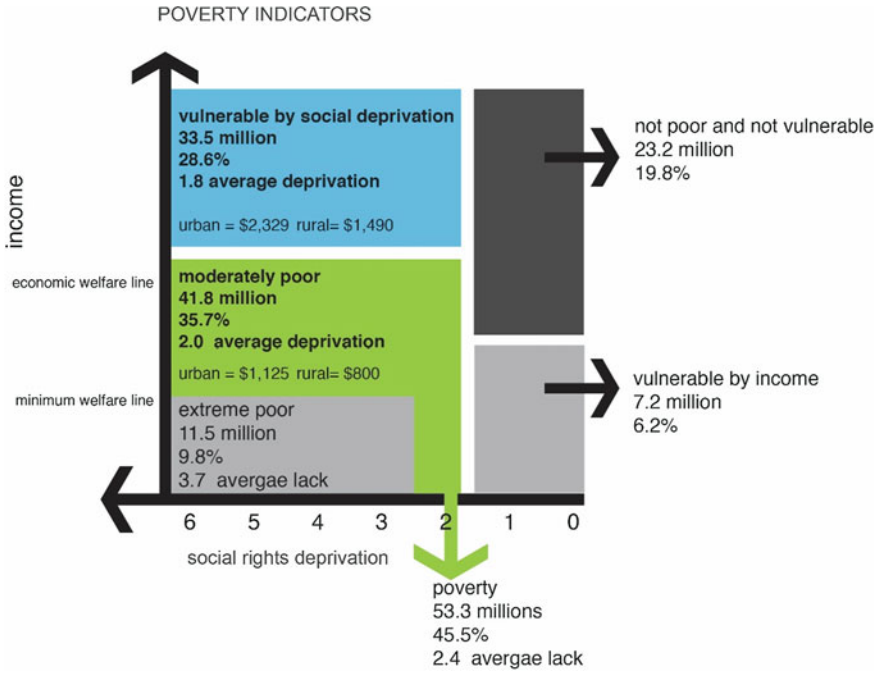

Fig. 2.3 Poverty indicators 2012. *Source* Own elaboration with data from Coneval

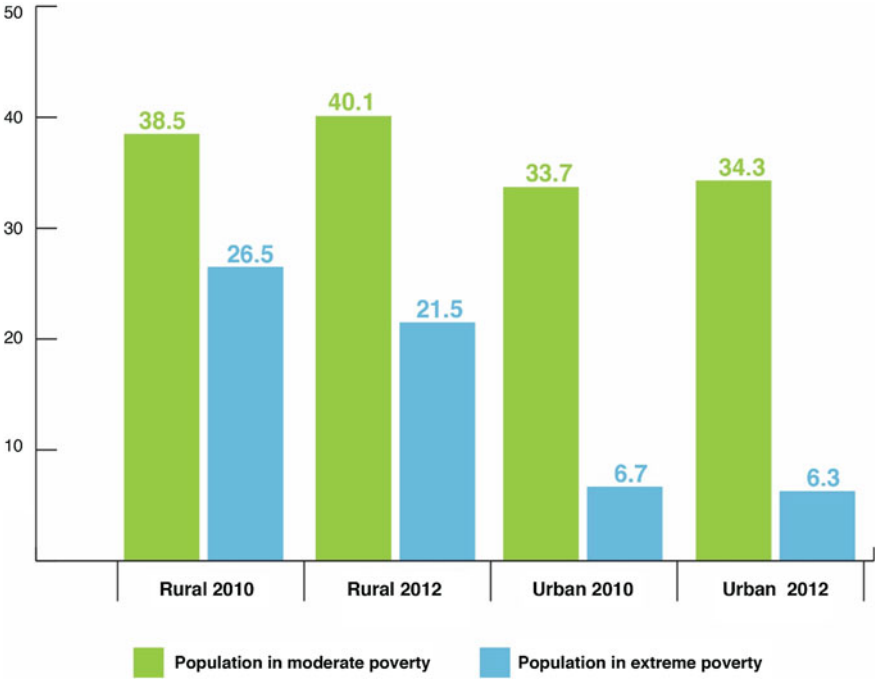

Fig. 2.4 Rural and urban poverty, 2010–2012. *Source* Coneval, Executive summary (2013)

Poverty and inequity in Mexico do not only manifest themselves among the different federal entities, they are also patent within them, for instance, income inequality among households was 0.453 at the national level. Being income distribution in Mexico one of the most inequitable in Latin America, a region marked as the most unequal in the world. In 2012, 30 % of households in the last three deciles of income distribution concentrated 56.3 % of the national current income; while the remaining 70 % only had 43.7 % of the income. 10 % of the most favored population concentrated 30.1 % of the income, while 30 % of the poorest population only had 11.9 % (ENIGH 2012) (Fig. 2.5).

2.2 Economic Distribution of the Population

In Mexico, economically active population (EAP) is 50.2 million people and it accounts for a 43.9 % of the total population; 13.3 % of the EAP is the primary sector (around 6 million people); 22.2 % is occupied in the secondary sector and 59 % in the third sector, mostly as informal employment. The unemployment rate was estimated at 4.8 % (INEGI 2012a, b).

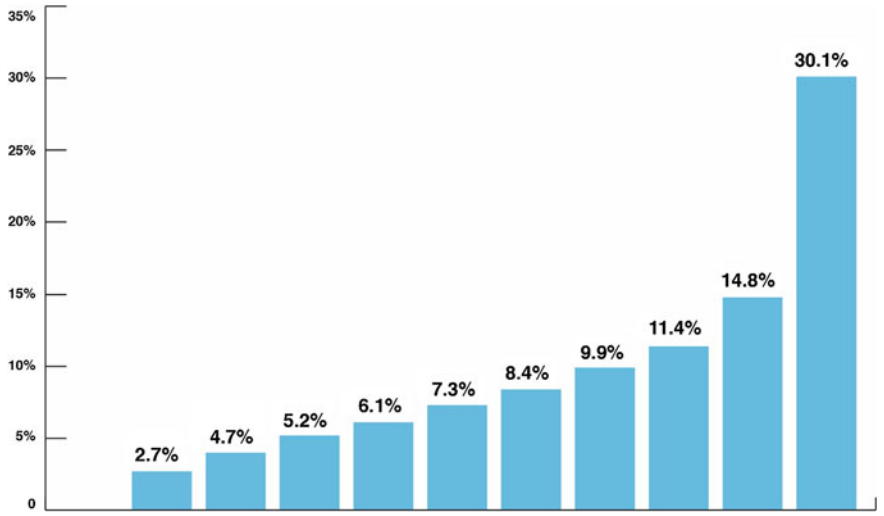

Fig. 2.5 Income distribution by deciles. *Source* own elaboration with data from the ENIGH 2012

The distribution of the economically active population, formerly mentioned, does not have a direct counterpart in product distribution. While the primary sector contains 13.7 % of the population, it only generates 4 % of the national gross domestic product, this is the result of the great differences in productivity that still persist between the primary sectors and the industrial and service sectors (Fig. 2.6).

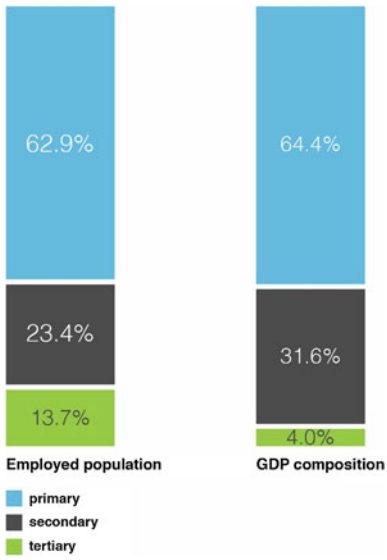

Fig. 2.6 GDP composition and employed population by sector, 2009. *Source* INEGI (2009)

A similar phenomenon takes place between population distribution, economic development and the amount of renewable water; thus, in the north, center and northeast part where 76.9 % of the population is concentrated and 78.9 % of the generated domestic product, only 31.74 % of renewable water can be found, versus the remaining 68.2 % which is found in the south and southeast parts of the country.

2.3 Conclusions

Mexico is a country of contrasts and inequalities in virtually every category: geographic, climatic, environmental and hydric; these inequalities go together with social and economic inequality between federal entities and within each of them.

There is a contradiction between development and water distribution; the states with the lowest level of income are those that have the largest quantity of hydric resources, coming fundamentally from precipitation. Nevertheless, in spite of the fact that a large portion of the population is employed in agricultural activities, they are not the main farm producers at the national level. Chiapas, Oaxaca and Guerrero present the highest marginalization and poverty indexes in the country, while they also have the biggest quantity of hydric resources.

The regions that now present the highest poverty indexes and the lowest in development, have enormous potential for development for alimentary security, given the human and hydric resources they possess.

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